Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	EB Docket No. 04-296
Review of Emergency Alert System	)	

A REPLY
by
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COMMENTING for the
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The Cellular Emergency Alert Service association, an international volunteer organization, has undertake for the last ten years, the initiative to identify, and promote a viable economic and technological model for the utilization of the unique broadcast messaging capability of 2nd generation cellular telecommunications networks to significantly reduce vulnerability to imminent threats to public safety as a commercially sustainable feature of global mobile personal communications service.

International acceptance and US deployments of the association's Cellular-EAS$^{2}_{SM}$ model detailed in this offering, bare witness to the practicality, availability, and logic of its conclusions, which are held relevant to the purposed rulemaking.

The data underlying this initiative work was the result of countless hours of 'skunk work' effort donated and gathered from emergency managers, telecommunications engineers, technology providers, and cellular subscribers, seeking to achieve better access to vital emergency instruction and information appropriate for a mobile society facing the increasing magnitude and frequency of both manmade and natural disaster events.

It is the intent of these comments to raise the commission's awareness of the availability of modern telecommunications solution, and implementation choices that will allow the information gained from investment of public dollars in new intelligence and response procedures to be delivered to the citizen-at-risk in time to benefit from it.

after-incident reports, homeland security strategies, informal surveys, public safety and hazard mitigation conferences, research papers, disaster news accounts, federal reports, and other sources.

The author was a founding member of the *Partnership for Public Warning* and is acknowledged in the federal report, *Effective Disaster Warnings*[1] (OSTP, Nov 2000).

Need for Improvement (NPRM paragraph 20)
Regarding the primary NPRM question of whether the EAS is suitable in present form or should be upgraded, the federal report, *Effective Disaster Warnings* states, "*The major problem in modern emergency management is the [lack] of an effective warning system that reaches every person at risk … no matter what they are doing or where they are located*."

Collected study data supports this statement. It shows serious weaknesses in the nation's public warning systems even when all systems are used together. In an email survey, the author asked Emergency Managers (EMs) to estimate the percentage of the public they could alert within 15 minutes for a major threat. Using all systems at their disposal, EMs with jurisdictions of 5.5M people estimated maybe 23% at 3AM and perhaps 40% at 10AM. Subsequent disaster events show these percentages to be optimistic.

At a June 2004 conference sponsored by the Partnership for Public Warning, a Florida Emergency Management (EM) official doubted he could reliably reach even 5% at 3AM. In show of hands, all voting attendees rated existing systems inadequate or worse.

EMs told us the efficacy of existing systems including EAS is being undermined by 'tight' building construction methods, Satellite TV, the Internet, movie rentals, mobile lifestyles, and call screening. When the color of the sky does not pre-sensitize people to a threat or when the threat is colorless or odorless, the accessibility of the public is considerably more problematic. People who are deaf and hard-of-hearing, staying in hotels or campgrounds, living in rural areas, or working in factories and warehouses, and shopping in malls are unreachable on short notice with any certainty. And when utility power fails, all bets are off. Additionally, transient populations may not be aware of localized pre-threat indicators, and would not necessarily know what local broadcast stations to tune to for information.

Clearly, the nation's public warning capabilities need improvement.

[1] Effective Disaster Warnings, Working Group on Natural Disaster Information System, Subcommittee of National Science and Technology Council, released Nov 8, 2000, http://www.fema.gov/pdf/rrr/ndis_rev_oct27.pdf

We agree with the PPW (NPRM paragraph 21) on the general need to retain mass radio / TV communications capabilities. However, the Cellular Emergency Alert Services association, however;

Recommendation 1: The inclusion of personal communications providers in an Cellular-EAS^2 partnership program with the mass communications broadcast stations that would allow citizens to benefit from the inherent communication strengths of both media. Personal telecommunications networks are perfectly suited to issue a brief 'first-alert' message to citizens-at-risk, warning of an imminent threat situation, and indicating what immediate actions are required, including the identification of the local EAS broadcast station(s) to tune to for detailed emergency instruction. This partnership leverages the best contribution of both media into a nearly perfect alert and advisory solution. With many of the new generation cellular terminals containing FM chips, a single wireless device could consummate the EAS^2 partnership.

Recommendation 2: The FCC should establish a 'Common Alert Protocol' and data management middleware program that would facilitate the dissemination of alert and advisory information to both mass and personal communications networks, as well as the appropriate response and mobilization entities.

Recommendation 3: The FCC should adopt a commercially sustained approach to the inclusion of cellular devices in the EAS program. The rapid evolution of technology in the personal telecommunications industry makes impractical the development of a realistic policy-driven Cellular-EAS^2 program. With safety being the single largest market segment for the purchase of mobile telecommunications service, it is more realistic for the Commission to encourage voluntary participation by the nation's carriers by providing;

- **Tax and auction credits to carriers that provide EAS as a no-cost public service**
- **Specific language to preclude liability claims by cellular carriers that voluntarily participate in the EAS program.**

If Cellular-EAS^2 can be demonstrated to have commercial benefit to the industry, it will automatically be continued thorough future generations of technology and service without need for new policy creation.

Geographic specificity is perhaps the greatest public warning challenge. Despite Specific Area Message Encoding (SAME), day care providers and other people complain about duplicate and non-applicable messages People who are deaf have largely rejected pagers as public warning devices for lack of geo-targeting capabilities. “I got tired of being alarmed for messages that didn’t apply to me on my side of town, especially at night.”

People don’t like solutions that don’t immediately differentiate between system tests, serious threats and duplicate warnings. Mothers bathing infants and operators of factory equipment resent the need to run to the TV only to find that the alert tone indicates a test.

Auto turn-on and forced tuning methods by themselves don't address external resource mobilization, local interagency notification, multiple language, altitude (flood plain, high-rise buildings), urgency coding, uninterruptible power, and other 'last-mile' communications issues.

Auto turn-on methods require continuous receiver operation. In some consumer devices, the additional power consumption would be significant and run counter to EPA 'green' energy conservation and standby power reduction initiatives.

Recommendation 4: The FCC should adopt the recommendations of the Telecommunications Industry Association TR 45.2 Committee Bulletin 114, "Wireless Network Communications for Emergency Messaging Broadcast" published, 1 December, 1999, as the US standard for participation by the personal telecommunications providers in the EAS program.

Recommendation 5: The FCC should favor development of EAS^2 standards in concert with international cellular broadcast emergency messaging initiatives like Cell@lert Service$_{SM}$. Because effect disaster management cannot stop at national boarders, and because mobile telecommunications is a global media, cellular broadcast emergency alert and advisory capability represents an ideal platform for international disaster mitigation.

- **Submissions to the ITU and 3GPP bodies have defined cell-broadcast channels to be used internationally for programs ranging from missing children alerts to humanitarian aid worker management. Additionally CEASa has recommended the use of specific cell-broadcast sub-channel ID for providing alert and advisory instructions in a citizen's native language regardless of his national presents.**
- **Efforts should be undertaken to standardize terminal response to broadcast emergency messaging insuring seamless display and handset behavior.**

Recommendation 6: The FCC should drop EAS header codes (NPRM paragraphs 19 in favor of Internet protocols, namely XML and XML Schema. EAS codes have historically lagged new threats. And local EMs say the codes don't support unique local problems that arise from time to time. An EM in northern Wisconsin cited a situation where a bear was roaming a city. NORAD has long wanted a means to flash asteroid warnings before occasional high-altitude disintegrations trigger thousands of calls.

The use of Internet protocols completely eliminates the mandatory / non-mandatory event code, EAS equipment updating, and update funding issues raised in NPRM paragraph 28.

Short EAS codes allow warnings to be transmitted through analog communications channels with audio frequency-shift keying methods but virtually all major communications systems developed in the last 15 years use digital modulation methods.

EAS codes represent both type and magnitude of threat – Tornado Warning. Type and magnitude have to be separated so people can better differentiate between very serious but low probability threats, and very serious and immediate threats People who are operating heavy equipment need to know whether to do an 'emergency' (very expensive) or orderly shut down of the plant.

Type and magnitude should also be separated for warning priority control reasons. Local EM officials have to prioritize warnings and other risk communications in overlapping emergencies. A locale may be confronted by a tornado at the same time the President needs to speak concerning a bio-terrorism attack on major metro area. The tornado may be a more immediate threat to the local populace. Digital computers and XML protocols together would permit a short delay of a Presidential statement to insert a tornado warning if necessary.

The message priority issue also begs for better geographic and audience targeting of all emergency communications including situations requiring EAS activation for a Presidential statement. This point is supported by the recent assignment of different Homeland Security Advisory System color levels to major East Coast cities and the rest of the country. Disaster areas rarely conform to pre-defined geographic areas that are assigned Specific Area Message Encoding (SAME) descriptors (NPRM paragraph 14)

We suggest the XML based Common Alerting Protocol (CAP) standard (NPRM paragraph 33) be considered as a starting point for EAS code replacement. We say 'starting point' because the CAP lacks mechanisms for mobilizing external resources and facilitating certain local interagency notification activities. As noted earlier, warning, mobilization, and notification, collectively, have to be made more efficient before local EMs can make general usage of certain advanced capabilities.

Internet protocols, a human interface using computer technology, and unified connectivity per Recommendation 9 would alleviate many of the training and equipment familiarity concerns raised in NPRM paragraph 44.

Recommendation 7: Regarding APAWS (NPRM paragraph 32) and PAW (NPRM paragraph 33), the FCC should favor new public warning technology. Most of the alternate systems - Internet, telephone auto-dialer, fax blaster, etc. - try to adapt common consumer technology to public warning missions. They accept the limitations imposed by these devices. But these limitations translate into a lack of essential features per the list in Recommendation 5.

Example: The recipient of a phone call cannot tell by the ring the content of the call – old high-school friend wants to chat, political campaign solicitation, or public warning.

We are not advocating total dismissal of the alternate systems above, however. They have back-up, mobilization, and other value in disaster management. All should be available and be used in the manner that best minimizes the consequences of each emergency situation. It makes no sense to tie-up every phone line resource for public

warning purposes and then not have the ability to mobilize the external resources needed for an effective disaster response.

Recommendation 8. The FCC should must emphasis on a new 'last-mile' public warning channel ((NPRM paragraph 32). The under-used Cell-Broadcast / SMS-Broadcast spectrum capabilities of GSM and CDMA cellular systems, respectively, provide a very suitable low bandwidth option. The author participated in a recent test of the GSM infrastructure and cell-phones in the US so the capability is known to be fully operational.

Cell-phone carriers continue to make massive investments annually to expand coverage. And Cells on Wheels (COWs) with crank-up towers, generators and satellite antenna linkages can be towed or air-dropped for rapid recovery from major physical destruction.

At the present time, no alternative 'last-mile' channel offers so much opportunity to improve the effectiveness of public warnings so quickly. All of the attributes and features listed in Recommendation 5 can be met with this channel.

Cell broadcasting can provide strategic messaging in two ways. The simple approach transmits a warning through the one or more cells that encompass the affected area. In the second approach, a description (polygon, ellipsoid, FIP) of the affected area is attached to the warning message and this information is transmitted through all cells over a larger region as appropriate to the situation. The latter method allows people who have been dislocated by an event like a hurricane to be recalled to their specific locale. It gives EMs more options in highly dynamic situations when they may need to change the warning for people who are already relocating out of the area. As GPS or other location capabilities are integrated into more cell-phones, the latter method becomes ever more appealing.

Cell-broadcasting is applicable to both 'fixed-site' devices for homes and offices use as well as mobility devices like 'smart phones' and automobile telematics. It's now entirely possible to achieve all desired features with dedicated warning / mobilization devices. Wall-cradle mounted and other 'fixed-site" variants can be built today with high-volume cell-phone chipsets and production lines. Only 4 buttons - silence alarm, scroll-up, scroll-down, delete message – would be needed for operation. And assuming that warnings were dispatched through all carriers, these devices could auto-roam across all networks for maximum signal redundancy and gap filling. These devices can easily drive highway signage, computer networks in large buildings, EAS decoders (demonstrated), factory floor sirens, etc.

Unfortunately, cell phones don't now provide all of the features cited earlier. Reception of cell-broadcast messages is generally delayed till voice communications is completed. People often turn-off phones during church services, concerts, meetings, and at night. Phones lack urgency coding mechanisms. Service contracts may limit roaming to carriers with inferior signal coverage in some areas.

Fortunately, these are not long-term limitations. Some of the missing features like urgency coding are relatively simple to add to cell phones from a technical standpoint. A growing number of phones can be upgraded over-the-air or at automated service kiosks that already dispense ring-tones and games. Some new features will require national technical recommendations and a unified voice from the emergency management community. But cell-phone turn-over rates are high, so new features can reach general usage in a couple of years. And both of the strategic messaging methods cited earlier could be used together while legacy phones are phased-out.

Officials in several cities have indicated that if 'fixed-site' devices of this type were available, they would advocate building codes for them like smoke alarms.

With new EAS rules, Cell-/SMS-Broadcasting, 'fixed-site,' cell-phones and automobile on-board telematic devices form a potent APAWS solution.

Recommendation 9: Regarding the warning language issues of NPRM paragraph 40, the FCC should guarantee continued availability of the cell-broadcast channel for public service applications.

- Information regarding the impact of cell-broadcast SMS on a cellular networks' normal operations and spectrum has been contradictory and in many cases totally incorrect leading to cellular providers choosing to disable the functionality in order to gain additional control and or messaging capacity.
- 'Smart' warning receivers can segregate and display a message in the preferred language from a data stream. These methods are not attractive options for analog communications services.
- For many common emergency situations like tornadoes, warnings can be pre-scripted (may have to fill-in affected locale) in multiple languages. Computer translation of simple message is also feasible though automatic translations are sometimes clumsy. Message text in various languages can easily be tagged (XML protocol) for dispatched to the various 'last-mile' channels.

Closing Comments:

The first and primary objective of government in a crisis event must be to communicate authority and control over the situation. On September 16, 2004, the Cellular Emergency Alert Service association documented the ability of a US cellular network to utilize a multi-network, shared cell-broadcast messaging platform to instantly deliver an EAS/SANE text message to all manufacture's terminals in a selected cell-sector. This live trial, and the deployment of a similar technology approach by foreign nations, including the Netherlands, demonstrates the ability to expand the EAS program to include 'other technologies' like Cell-Broadcast Short Messaging Service is an immediately available solution to significantly enhance the 'last-mile' in emergency alert and advisory.

Modernization of the EAS program to address the challenges of the 21st century is no longer a technology or economic issue, simply the political will to reach out to new ideas and embrace change.

We urge bold leadership in fixing the nation's emergency information highway that includes the EAS. The performance of existing public warnings systems, even when used collectively, is clearly inadequate. Incremental fixes of EAS rules and equipment standards will not be sufficient to allow general usage of new EM tools and methods by local EM agencies. These tools and methods are essential for dealing with major disasters, particularly catastrophic WMD events.

While hazard sensor technology – weather radar, etc. – has improved steadily, 'last-mile' technology has barely budged in the last 5 decades. This imbalance must be addressed with major revisions of EAS rules and operating methods and other steps. The consequences of major calamities like September 11, 2001, are simply too great to accept minor changes.